VUF-1017
FINAL REPORT

VELA UNIFORM

PROJECT SHOAL

SPONSORED BY THE ADVANCED RESEARCH PROJECTS AGENCY OF THE DEPARTMENT OF DEFENSE AND THE U. S. ATOMIC ENERGY COMMISSION

FALLON, NEVADA
OCTOBER 26, 1963

FEDERAL AVIATION AGENCY AIRSPACE ADVISORY

Federal Aviation Agency
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FEDERAL AVIATION AGENCY AIRSPACE ADVISORY

PROJECT SHOAL

FINAL REPORT

H. M. VICK - A. D. CARTER

FAA/AEC Liaison Officers

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I. OBJECTIVE

To delineate a sector through which, had the shot vented, a contaminated air mass would have been expected to move and through which nonparticipating military or civilian aircraft would be advised not to fly. Had venting occurred, such predesignation of a potentially hazardous air space would have avoided startling pilots flying near the test site, prevented unintentional penetration of a contaminated air mass, and minimized traffic hazards to participating aircraft.

II. COORDINATION

Responsibility for preparation of the Project Shoal Air Space Advisory plan was assigned by the Project Manager to the Radiological Safety Branch, Operational Safety Division, NVOO. Details of the plan were subsequently formulated through the coordinated efforts of personnel from the Radiological Safety Branch, the Federal Aviation Agency's Los Angeles Air Route Traffic Control Center, and the U. S. Weather Bureau.

III. PROCEDURES

On October 9, 1963, the FAA, Los Angeles Air Route Traffic Control Center mailed a circular letter to (12) twelve small airports i.e.; Fallon, Tonopah, Warm Springs, Schurz, Yerington, Eureka, Austin, Ely, Mina, Round Mountain, Hawthorne and Gabbs, Nevada giving advance information on the proposed Shoal event. The purpose of this measure was to alert any "no-radio" pilots who might otherwise receive no notice and consequently penetrate the airspace advisory area.

On October 15, 1963, when informed of a delay in the scheduled date of the event, the FAA notified the above airport operators, advising them not to expect the exercise prior to October 26, 1963.

Beginning at 6:00 A.M. PDT on October 26, 1963, 19 FAA Flight Service Stations broadcast semi-hourly warnings to all pilots contemplating off airway flight below 13,000 feet MSL between 9:30 A.M. PDT Saturday and 3:00 A.M. PST Sunday within an area bounded by Elko, Nevada VORTAC; Mount Moses, Nevada VOR, Hazen, Nevada VOR; Mina, Nevada VOR; Currant, Nevada VOR and Elko, Nevada VORTAC to contact the nearest FAA facility for safe routing advisory.

At 11:30 P.M. PDT October 25, 1963 after consulting with representatives of the U.S.W.B. and A.E.C., Operational Safety Division, the actual airspace to be avoided was defined to Air Route Traffic Control Centers at Los Angeles, Oakland and Salt Lake City as follows:

> "The airspace from the surface to 12,000 feet MSL bounded by radials of 080° True and 140° True from the Project Shoal site extending 50 nautical miles southeastward."

The portions of the arc that penetrated Federal Airways V108 and V1732 were excluded from this restriction.

At 8:15 A.M. PDT October 26, 1963 the foregoing airspace definition was determined to agree with current meteorological conditions and was so confirmed to the Los Angeles, Oakland and Salt Lake City Centers.

Procedures (continued)

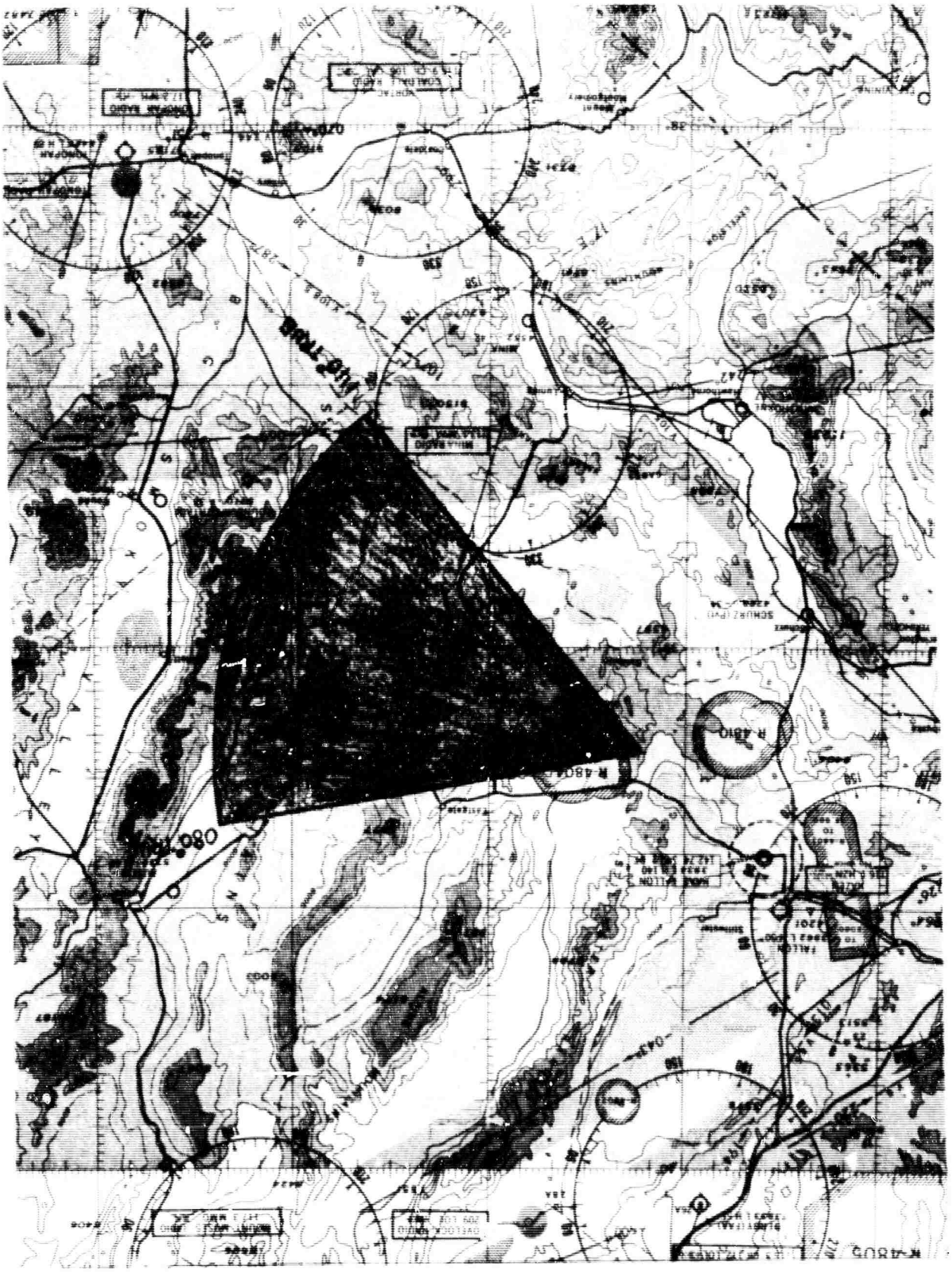
From 9:00 - 10:00 A.M. PDT October 26, 1963 phone calls were placed to the above listed airport operators providing them a description of the rectangular advisory area. This discription was also converted to highway definition for use of pilots not familiar with the FAA airway designations and navigational aids.

During the time period when the airspace advisory was in effect (9:30 A.M. PDT October 26, 1963 to 3:00 A.M. PST October 27) a total of ten general aviation aircraft were provided safe routing advisories. Of this number only three aircraft required a change in route of flight. The nature of the broadcast advisory was such that most pilots could avoid the defined airspace without necessity for securing individual instructions.

Developments that might have resulted in revisions to airspace definition or duration of the advisory were checked at 4:30 P.M. PDT and 9:30 P.M. PDT October 26. No revisions were deemed necessary by AEC representatives and the airspace advisory was subsequently cancelled at 3:00 A.M. PST October 27 as originally planned.

IV. CONCLUSIONS

The FAA has concluded that the Project Shoal Air Space Advisory Plan provided all proper precautions necessary to ensure against radioactive contamination of airmen or aircraft.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TECHNICAL REPORTS SCHEDULED FOR ISSUANCE BY AGENCIES PARTICIPATING IN PROJECT SHOAL

AEC REPORTS

Agency	Report No.	Project No.	Subject or Title
NBM	VUF-1001	33.2	Geological, Geophysical and Hydrological Investigations of the Sand Springs Range, Fairview Valley and Fourmile Flat, Churchill County, Nevada
SC	VUF-1002	40.5	Seismic Measurements at Sandia Stations
SC	VUF-1003	45.3	Hydrodynamic Yield Measurements
SC	VUF-1004	45.5	Device Support, Arming, Stemming and Yield Determination
SC	VUF-1005	45.6	Radiological Safety
EG&G	VUF-1006	60.4	Final Timing and Firing Report - Final Photo Report
USBM-PRC	*		Subsurface Fracturing From Shoal Nuclear Detonation
USWB	VUF-1008		Weather and Surface Radiation Prediction
USPHS	VUF-1009		Off-Site Surveillance
USBM	VUF-1010		Structural Survey of Private Mining Properties
USC&GS	VUF-1011		Seismic Safety Net
REECo	VUF-1012		On-Site Health and Safety Report

	Agency	Report No.	Project No.	Subject or Title
	RFB, Inc.	VUF-1013		Analysis of Shoal Data on Ground Motion and Containment
	H-NSC	VUF-1014		Shoal Post-Shot Hydrologic Safety Report
	H&N	VUF-1015		Pre-Shot and Post-Shot Structure Survey
	H&N	VUF-1016		Test of Dribble-Type Structures
	FAA	VUF-1017		Federal Aviation Agency Airspace Advisory
			DOD REPORTS	
	SC	VUF-2001	1.1	Free Field Earth Motions and Spalling Measurements in Granite
	SC	VUF-2002	1.2	Surface Motion Measurements Near Surface
**	USC&GS	VUF-2300	1.4	Strong Motion Seismic Measurements
	LPI	VUF-2600	1.6	In-Situ Stress in Granite
**	STL	VUF-2400	1.7	Shock Spectrum Measurements
	SRI	VUF-3001	7.5	Investigation of Visual and Photographic On-Site Techniques
	SRI	VUF-3002	7.6	Local Seismic Monitoring - Vela CLOUD GAP Program

	TI	VUF-3003	7.8	Surface and Subsurface Radiation Studies
	USGS	VUF-3004	7.9	Physical and Chemical Effects of the Shoal Event
	ITEK	VUF-3005	7.10	Airborne Spectral Reconnaissance
	BR Ltd.	VUF-3006	7.15	The Mercury Method of Identification and Location of Underground Nuclear Sites
	NRDL	VUF-3007	7.16	Multi-Sensor Aerial Reconnaissance of an Underground Nuclear Detonation
	GIMRADA	VUF-3008	7.17	Stereophotogrammetric Techniques for On-Site Inspection
	ISOTOPES	VUF-3009	7.19	Detection in Surface Air of Gaseous Radionuclides from the Shoal Underground Detonation
***	USC&GS		8.1	Microearthquake Monitoring at the Shoal Site
****	GEO-TECH		8.4	Long-Range Seismic Measurements

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* This is a Technical Report to be issued as PNE-3001 which will receive TID-4500 category UC-35 Distribution "Nuclear Explosions-Peaceful Applications"

** Project Shoal results are combined with other events, therefore, this report will not be printed or distributed by DTIE

*** Report dated March 1964 has been published and distributed by USC&GS

**** Report dated December 9, 1963, DATDC Report 92, has been published and distributed by UED

LIST OF ABBREVIATIONS FOR TECHNICAL AGENCIES

BR Ltd.	Barringer Research Limited Rexdale, Ontario, Canada
EG&G	Edgerton, Germeshausen & Grier, Inc. Boston, Massachusetts Las Vegas, Nevada Santa Barbara, California
FAA	Federal Aviation Agency Los Angeles, California
GEO-TECH	Geo Technical Corporation Garland, Texas
GIMRADA	U. S. Army Geodesy, Intelligence and Mapping Research and Development Agency Fort Belvoir, Virginia
H-NSC	Hazleton-Nuclear Science Corporation Palo Alto, California
H&N, Inc.	Holmes & Narver, Inc. Los Angeles, California Las Vegas, Nevada
ISOTOPES	Isotopes, Inc. Westwood, New Jersey
ITEK	ITEK Corporation Palo Alto, California
LPI	Lucius Pitkin, Inc. New York, New York
NBM	Nevada Bureau of Mines University of Nevada, Reno, Nevada
NRDL	U. S. Naval Radiological Defense Laboratory San Francisco, California
REECo	Reynolds Electrical & Engineering Co., Inc. Las Vegas, Nevada
SC	Sandia Corporation Albuquerque, New Mexico
SRI	Stanford Research Institute Menlo Park, California

RFB, Inc.	R. F. Beers, Inc. Alexandria, Va.
STL	Space Technology Laboratories, Inc. Redondo Beach Park, California
TI	Texas Instruments, Inc. Dallas, Texas
USBM	U. S. Bureau of Mines Washington, 25, D. C.
USBM-PRC	U. S. Bureau of Mines Bartlesville Petroleum Research Center Bartlesville, Oklahoma
USC&GS	U. S. Coast and Geodetic Survey Las Vegas, Nevada
USGS	U. S. Geologic Survey Denver, Colorado
USPHS	U. S. Public Health Service Las Vegas, Nevada
USWB	U. S. Weather Bureau Las Vegas, Nevada